

LINKING THE DEEP AND RECENT PAST TO THE
MODERN NEW ENGLAND LANDSCAPE

DAVID R. FOSTER

Harvard Forest, Harvard University, Petersham, MA 01366
e-mail: drfoster@fas.harvard.edu

SUMMARY. The very long-term record provided by paleoecological studies indicates that rates of vegetation change during the relatively brief period since European settlement are the greatest since the last Ice Age. Interpreting the details of these changes and their persistent effects on modern landscapes at a range of spatial scales provides critical information for ecologists, conservation biologists, and natural resource managers. At a regional scale (i.e., New England excluding northern Maine) the landscape was largely deforested, farmed intensively, and, over the past 150 years, allowed to reforest naturally to produce extensive semi-natural woodlands interspersed with urban and suburban areas. One consequence of this history is that many open-land plants and animals, including several that are high priorities for conservation, thrived during the agricultural 18th and 19th centuries and have declined greatly over the recent past. In contrast, as forests have expanded and continued to mature there has occurred a remarkable expansion of native woodland species. At a sub-regional scale (i.e., north-central Massachusetts) this history is associated with a broad-scale homogenization of forest canopy composition. Although tree species abundance varied with climate gradients at the time of European settlement no such relationship exists today. In contrast, many herb and shrub species do exhibit striking variation in modern distribution with climate across the same area. Importantly, the change in tree composition apparently involves two processes: the very long-term decline in species such as hemlock and beech, which actually began more than 500 years ago in response to climate change, and a regional increase in successional and sprouting species due to land use.

On a landscape scale, vegetation structure and composition are apparently much more homogeneous and patchy than at European settlement as they currently vary on a fine scale with land-use histories. Site history, along with variation in soil conditions, is a strong determinant of modern species distributions because plant species vary so widely in their response and ability to re-

cover and re-establish after, for example, fire, forest cutting, grazing, or plowing. Stand-level pollen records suggest that the canopy composition of most forests was completely changed by this history and bears little resemblance to earlier forests on the same sites (Foster and O'Keefe 2000).

Recognition that New England is a cultural landscape shaped in most details by its history of intensive human activity is an essential background for understanding modern ecological processes. Interpretation of the details of this history at geographical and temporal scales relevant to specific concerns can afford tremendous insights into land management and conservation policy (Foster 1999).

LITERATURE CITED

- FOSTER, D. R. 1999. *Thoreau's Country: Journey through a Transformed Landscape*. Harvard Univ. Press, Cambridge, MA.
- AND J. O'KEEFE. 2000. *New England Forests through Time: Insights from the Harvard Forest Dioramas*. Harvard Univ. Press, Cambridge, MA.